

The applicability of active teaching-learning methodologies in health: An integrative review

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Abstract— Objectives: to identify in the literature the applicability of active teaching-learning methodologies in health. Methodology: integrative review carried out in the Virtual Health Library using the descriptors in health sciences: Active methodologies; Health; Applicability. Results: 31,500 articles were found and, after careful reading, eleven were selected in the Virtual Health Library. The making of the patchwork quilt stood out; Digital Information and Communication Technologies; twine; thematic workshops with practical activities and previous questions for reflection and criticism were also used; patient care, analysis of real cases, role-playing (decision making and competence demonstration); documentaries and television series; mock jury; conversation wheel; movie theater with popcorn; tutorial group; constructivist spiral; flipped classroom and peer instruction, as well as its pedagogical foundations; problematization with the Arch of Charles and Maguerez; Project-Based Learning; the three Pedagogical Moments; Puppet theater and musical parodies; Directed study, flipped classroom, concept map and mind map; interactive dialogued class; case studies; oral presentation of contents; kahoot; Forum; LPAM (Learning Practice Assessment Material); ESCAPE ROOM; Problem Based Learning; Video lessons; theaters and recreational activities. Final Considerations: Reflective teaching, appropriate to the context, of methodological quality has the ability to instigate an expanded and transdisciplinary vision, in addition to promoting social changes resulting from the increase of individual and collective awareness.

I. INTRODUCTION

The current world requires higher education institutions to demonstrate efficiency in the training of

students, to bring solutions to the health of the population and promote a reflective practice that collaborates to face

the challenges imposed by the moment that Brazilian health is experiencing [1].

The National Curriculum Guidelines show the indispensability of higher education aimed at the job market, which requires trained professionals to act with social responsibility, commitment to citizenship to promote the health of the population [1].

To develop this profile, several methodological approaches can be incorporated into the teaching-learning process, including adherence to active methodologies. There are varied teaching methods, from the most traditional models to the most contemporary methodologies [2].

The proposal of active methodologies is to improve the learning system that teachers use to direct the critical training of future professionals in the most varied areas [3].

Its benefits consist of student autonomy, arousing curiosity, encouraging private and global decision-making. The teacher is no longer the center of the teaching-learning process and the student becomes responsible and participant in this process, at which time he goes in search of his knowledge, acquiring professional skills that he would probably not be able to if he were experiencing a traditional way of teaching, which is carried out in a fragmented and teacher-centered way, not encouraging student autonomy in the production of knowledge [4].

The applicability of active teaching-learning methodologies is essential, which provide the formation of knowledge according to the obstacles of reality, as well as the union of indispensable and professionalizing contents, the junction between theory and practice [5].

Currently, there are numerous teaching-learning strategies that lead to satisfactory learning, such as Problem-Based Learning (PBL) or Team-Based Learning (TBL), which are the best known [5].

Furthermore, within these methodologies, several techniques can be used as work in small groups; commented readings; discuss topics; socialization; musical interpretation; film presentation; workshops; round tables; dramatizations; seminars; playful-pedagogical dynamics; plenary; critical experience report; dialogued exhibitions;

oral assessment; wallet; among others, which can also compose the active teaching-learning method [5].

From the delimitation of the theme, the present study aimed to identify in the literature the applicability of active teaching-learning methodologies in health.

II. METHODOLOGY

This is an integrative literature review, a study that focuses on synthesizing research results and showing conclusions from the corpus of literature on a given phenomenon, comprising studies related to the guiding question that guides the search for this literature.

This is an integrative literature review, developed from the need to synthesize research results and present conclusions from the corpus of literature on a given phenomenon, comprising studies related to the guiding question that guides the search for this literature [6].

For its conduction, the following steps were followed: (1) identification of the theme with elaboration of the guiding question; (2) inclusion/exclusion criteria for articles; (3) search for articles in the database; (4) evaluation of studies and critical analysis; (5) categorization of studies; (6) interpretation of findings [7].

To understand the theme, we chose the following guiding question: What is the applicability of active teaching-learning methodologies in health?

As for the inclusion criteria, they were: original and complete articles, freely available, published in Portuguese, between the years 2017 to 2021. In addition, as for the exclusion criteria, they were: repeated files, reviews, theses, congress abstracts, undefined period, unrelated to the topic studied and studies that did not answer the guiding question.

The present review was carried out in February 2022, and the following criteria were chosen for the selection of publications indexed in the Virtual Health Library (VHL): articles whose main theme were the following descriptors in health sciences: Active Methodologies, Health and Applicability, which were submitted to the simultaneous crossing with the help of the Boolean operator "AND" between them.

Table 1: Characterization of studies in terms of title, author, year of publication and objective.

N	Title	Author / Year	Objective
A1	Metodologias Ativas e Aprendizagem Significativa: Processo Educativo no Ensino em Saúde.	Pereira et al. (2021)	To analyze an educational practice, according to the theory of meaningful learning, on active methodologies in health education, carried out in the Postgraduate Program in Health Education, professional master's degree, at the State University of Mato Grosso do Sul.
A2	Metodologias ativas na educação interprofissional em saúde.	Alencar et al. (2020)	To report the experiences of using different resources of active methodologies in PET- Saúde Interprofissionalidade.
A3	Metodologias ativas de aprendizagem no ensino superior de saúde: o fazer pedagógico.	Veloso; Pequeno; Negreiros (2019)	To describe, from the point of view of higher education teachers, understandings about the new methodologies for pedagogical practice after a training course.
A4	Metodologias ativas em um curso de formação em saúde.	Ross et al. (2020)	Know the reflections of an expert on the use of active methodologies in that course.
A5	Metodologias ativas de aprendizagem: práticas no ensino da Saúde Coletiva para alunos de Medicina.	Assunção (2021)	To report teaching experiences in the development and application of active learning methodologies in the teaching of Public Health to medical students.
	Metodologias ativas de aprendizagem: caminhos possíveis para inovação no ensino em saúde.	Macedo et al. (2018)	To report the experience of professors in the discussion of active learning methodologies as a problematizing pedagogical strategy for higher education in health.
A7	Formação docente e a utilização de metodologias ativas: uma análise de teses e dissertações	Soares, Engers, Copetti, (2019)	To demonstrate, through the experience report of a group of academics from the third period of the medicine course at the Federal University of Delta do Parnaíba, the importance of playing in the teaching-learning process, as well as identifying how such learning methodologies intersect in the formation of course students.
A8	Aplicação do lúdico para o ensino de saúde na educação médica da cidade de Parnaíba, Piauí: relato de experiência.	Costa et al. (2020)	To demonstrate, through the experience report of a group of academics from the third period of the medicine course at the Federal University of Delta do Parnaíba, the importance of playing in the teaching-learning process, as well as identifying how such learning methodologies intersect in the formation of course students.
A9	Domínio das metodologias ativas por docentes de curso de graduação em Enfermagem.	Dias et al. (2020)	To analyze the training course for the acquisition of teaching skills of the nurse teacher in the application of active methodologies.
A10	A aplicação de metodologias imersivas nos cursos de metodologia híbrida da área da saúde e bem-estar na educação a distância (ead).	Moraes; Daros (2019)	To present the pedagogical model with the application of Immersive Methodologies in Health and Wellness courses, in the distance modality, as well as its benefits as a teaching methodology, for training qualified professionals to solve real problems in the globalized world, with emphasis on primordial knowledge for clinical care.
A11	Metodologias ativas no processo de ensino-aprendizagem de anatomia e neuroanatomia.	Marchior; Carneiro. (2018)	Analyze the strengths and weaknesses of active learning methods in the teaching of Anatomy and Neuroanatomy, in addition to suggesting applicable techniques.

Table 2: Applicability of active teaching-learning methodologies in health.

N	Evidence
A1	The making of the patchwork quilt rescued the knowledge, as well as provided the exchange of experiences and reflections. The problematization triggered a consensus that teaching methodologies should be strategically planned, considering the context and the actors involved. The conceptual map as an educational strategy and formative assessment showed that the master's students developed significant learning in the addressed topic. The string intonation on the theory of meaningful learning aroused the interest and attention of the students.
A2	Due to the context of the COVID-19 pandemic, it was also possible to intensify the use of Technologies and Communication, information tools for the teaching-learning process. Mind maps, concept maps and flowcharts were used; games based on reading official documents (National Curricular Guidelines for the Pharmacy Course); construction of a color entitled "The Consolidated Giant Express" redefining elements of the history of the Unified Health System and the need to strengthen it; and the production of a podcast with a thematic approach on Interprofessionality in the context of the COVID-19 pandemic. Other resources such as flipped classes, thematic workshops with practical activities and previous questions for reflection and criticism were also included; to the patient, analysis of real care, role-playing (decision making and demonstration of competence) in cases of interprofessionality; use of films, documentaries and television series.
A3	As for the development of skills, it obtained an excellent rating, standing out equally to all at 92.3% in terms of knowledge of the concepts, contributions and limitations of active methodologies and understanding of the stages of PBL, in the ability to deal with the dynamics of group work and in the attitude of dealing with conflict situations during educational activities, favoring group empathy. As for the strategies used during the workshops, the questions about content, exposure were clearly evaluated and the answers were compiled into regular, good and excellent. It was shown that the excellent concept stood out, with emphasis on the simulated jury in 84.9%; followed by the circuit, with 76.9%; and also with 69.2% for conversation circles; and handwritten. However, the cinema with popcorn and the tutorial group did not have expressive acceptance, with the good concept prevailing in 61.5% and 53.8%, respectively.
A4	The constructivist spiral, the problematizing methodology, team learning and other diversified and efficient educational actions stood out.
A5	Three methods were discussed: project design, flipped classroom and peer instruction, as well as their pedagogical foundations.
A6	The problematization with the Arch of Maguerez facilitated the understanding and applicability of active methodologies.
A7	Problematization Methodology with the Arch of Maguerez (04), Project-Based Learning (03), Problem Solving (02) and The Three Pedagogical Moments (01).
A8	Puppet theater and musical parodies, described, from the definition of the playful method, the elaboration of a presentation script and the preparation of materials, until its execution for the other students. Thus, the material and content produced were presented in the respective class of the parasitology and microbiology module.
A9	Directed study, inverted classroom, conceptual map and mind map, followed by interactive dialogued class, case studies, oral presentation of contents and kahoot.
A10	Forum techniques were used; LPAM (Learning Practice Assessment Material) and SALA ESCAPE.
A11	Techniques of practical classes were used; Problem-based teaching; Video classes; theaters and recreational activities.

III. DISCUSSION

Among the methodologies described in the results, there is the making of Patchwork, which consists of a method that rescues previous knowledge, in addition to providing an exchange of experiences and reflections. It is a device inspired by the children's book "Colcha de Retalho", by Conceil Corrêa Silva and Nye Ribeiro (2010), and by the film "Colcha de Retalhos" (How to make an American quilt, by Jocelyn Moorhouse, USA, 1995), in which case you must "weave a quilt" bringing together pieces with different stories, knowledge, desires and walks

that can transform yourself and the environment around you [8].

The problematization, which triggered a consensus that teaching methodologies should be strategically planned, considering the context and the actors involved. The conceptual map as an educational strategy and formative assessment evidenced the development of meaningful learning. The intonation of strings on the theory of meaningful learning aroused the interest and attention of the students. The educational practice generates

problematization, reflection and resignification, both in the participants and in the mediators [8].

The use of these resources is privileged to stimulate critical-reflective thinking and the consequent decision-making to solve everyday problems and develop other skills, such as communication, teamwork, leadership, collaborative practice, clarification and interaction of roles [9].

This experience allows us to verify that the use of different learning strategies is a very positive didactic resource in the knowledge construction process [9].

Pedagogical competences are centered on the need for the teacher to seek constant improvement, to adapt the methods to the new curricular requirements recommended by the National Curriculum Guidelines [10].

The current needs for professional training demanded by the job market, the profile of students enrolled in higher education, the need to comply with the National Curricular Guidelines and effective supervision by the Ministry of Education, makes Higher Education Institutions concerned about compliance with the measures imposed by government evaluators on the quality of the education offered, since there can be no compromise in the recognition of the courses or in the accreditation of the institution [10].

Another important methodology is the Constructivist Spiral, which promotes the identification of problems, the formulation of explanations and the elaboration of learning questions, through the search for new information, construction of new meanings and evaluation [11].

When using the Constructivist Spiral, the determination of problems is directly linked to previous knowledge, interpretations, sensitivities, and values brought by everyone. The problems listed by the group can be aggregated, by approximation, and present the starting point of the pedagogical process [11].

During the teaching-learning process, the coherence between the values of the current generation of students, the paradigm shifts in the provision of health services and the practices of pedagogical innovations allied to the use of Digital Information and Communication Technologies in teaching projects must be observed. The use of techniques such as the flipped classroom and peer instruction, supported by Digital Information and Communication Technologies, reshapes the classroom to make learning more meaningful [12].

Students' doubts are common, interpreted as tensions between the passivity in which they find themselves in the traditional model and the appeal for greater involvement when active learning methodologies are used. Faced with

this situation, the teacher must make the didactic transposition and overcome deficiencies in communication skills [12].

The problematization methodology is present in some methods that can support teaching, among them PBL or Problem Based Learning (PBL), Team Based Learning (TBL), Charles and Maguerez Arch and Project Based Learning (PBL). These last two differ from the others, as they work with a real Problem Situation and the study takes place to solve it [13].

Furthermore, the potential of the Problematization Methodology has been adopted in research in higher education, especially in the health area [14].

It is noteworthy that the application of the Problematization Experience Methodology provides knowledge, differentiation and reflection on active methodologies as combinations, in addition to proposing opportunities and paths for an active application of learning, in order to transform teaching practices [14].

Among the active methodologies most used today, there are the pedagogical ones of ludic teaching that have demonstrated efficiency in the process of construction of knowledge by allowing communication between different areas of human cognition, stimulating the development of language (verbal and non-verbal), personality, interpretation, and coordination [15].

Teachers need to take ownership of these work tools, they need to know them so that they feel safe to apply them, and this is largely up to higher education institutions, which should encourage the exposure of different ways of applying this innovative knowledge [16].

In the advent of virtual teaching, as well as in the hybrid model, several active methodologies have been highlighted, such as the forum, which constitutes an asynchronous activity that takes the student to the process of theoretical-practical reflection on the content covered in the discipline and allows to build knowledge collaboratively and discuss with your colleagues, tutors and teachers in training [17].

Gamification has been increasingly used, such as Escape Room, which is a form of game whose mechanics are based on solving clues, puzzles and problems to free yourself from a closed room. To escape the closed rooms and complete the proposed challenge, it is necessary to pass the tests within the deadline, which is a way to practice and evaluate the knowledge learned [17].

The Practical Learning Assessment Material (PLAM) is a differential in the application of immersive methodologies, as it refers students to an experience based on the real challenges of the profession. This comes to

provide meaningful experiences for the student to perceive the applicability of the contents [17].

Currently, Digital Information and Communication Technologies are widely disseminated, making this tool in the teaching-learning process impossible. Realistic simulation, which uses fictitious patients or mannequins, virtual learning objects (educational game software, videos, audios, web technology) has stood out among the active pedagogical practices in health education [18].

Thus, the profile of the student today is as dynamic as the technologies, as the vast majority were exposed to the internet and electronic media from a very young age. The students' difficulty does not consist in access or knowledge of the technological tool, but in the discernment, maturity and perception of the real applicability for use in the classroom. [18].

IV. FINAL CONSIDERATIONS

Through this literature review, it was possible to identify the main active methodologies that have been used in the teaching-learning process in health.

Reflective teaching, appropriate to the context, of methodological quality, can instigate an expanded and transdisciplinary vision, in addition to promoting social changes resulting from the increase of individual and collective awareness.

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